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What is claimed is:

1   1.   A method of measuring a pattern comprising:

2   exposing an evaluation pattern having at least two

3   light-impermeable line patterns to form on a target a plurality

4   of transferred patterns each based on said evaluation pattern;

5   and

6   detecting which one or ones among said transferred patterns

7   is brought into a state that any one of said two light-impermeable

8   line patterns disappears.

1   2.   The method as claimed in Claim 1, wherein a plurality of

2   said evaluation patterns are provided on a single mask, and said

3   exposing is executed with said single mask to thereby form said

4   plurality of transferred patterns on said object.

1   3.   The method as claimed in Claim 2, wherein at least one

2   of said light-impermeable line patterns is different from one

3   another among said evaluation patterns.

1   4.   The method as claimed in Claim 3, wherein each of said

2   evaluation patterns has at least one additional

3   light-impermeable line pattern between said two

4   light-impermeable line patterns, and in at least one of said

5   evaluation patterns, each of said two light-impermeable line

6   patterns is different in width from said additional

7   light-impermeable line pattern.

1   5.   The method as claimed in Claim 3, wherein said plurality

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2 of evaluation patterns are arranged adjacent to one another to

3 constitute a group, and a plurality of said groups are distributed

4 on said mask.

1 6.   The method as claimed in Claim 1, wherein said exposing

2 is executed a plurality of times with a mask having said evaluation

3 pattern so that said plurality of transferred patterns are formed

4 on said target.

1 7.   The method as claimed in Claim 6, wherein said exposing

2 are executed a plurality of times while varying exposure amount

3 for each exposure.

1 8.   The method as claimed in Claim 7, wherein a plurality of

2 ones of said evaluation pattern are formed and distributed on

3 said mask, and the each of said light-impermeable line patterns

4 is identical in width among said evaluation patterns.

1 9.   A method for measuring a coma aberration in an optical

2 system with a projection optical system, the method comprising:

3   illuminating with light a mask that is provided with a

4 evaluation pattern having at least two light-impermeable line

5 patterns;

6   leading the light through said mask to said projection

7 optical system and exposing a target with an output from said

8 projection optical system to create on said target a plurality

9 of transferred patterns each based on said evaluation pattern;

10   detecting which one or ones among said transferred patterns

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11   is brought into state that any one of said two light-impermeable

12   line patterns disappears; and

13   evaluating a coma aberration in said projection optical

14   system according to a result of said detecting.

1   10.   The method as claimed in Claim 9, wherein a plurality of

2   said evaluation patterns are provided on said mask and said

3   exposing is executed with said mask to form said plurality of

4   transferred patterns on said target, and at least one of said

5   light-impermeable lines is different from one another among said

6   evaluation patterns.

1   11.   The method as claimed in Claim 10, further comprising:

2   determining a correlation between magnitude of coma

3   aberration belonging to said projection optical system and the

4   line widths of a state where one of said two light-impermeable

5   line patterns disappears,

6   wherein the magnitude of coma aberration is determined

7   from said correlation and said result of detection.

1   12.   The method as claimed in Claim 9, wherein a plurality of

2   transferred patterns are formed on said target by executing said

3   exposing a plurality of times with said mask while varying

4   exposure amount for each exposure.

1   13.   The method as claimed in Claim 12, further comprising:

2   determining a correlation between magnitude of coma

3   aberration belonging to said projection optical system and the

4　light exposures of a state where any one of said two

5　light-impermeable line patterns disappears,

6　　　　wherein the magnitude of coma aberration is determined

7　from said correlation and said result of detection.

1　14.　A coma aberration measuring method comprising:

2　　　　placing an evaluation mask on a mask stage of a projection

3　exposure device;

4　　　　placing an evaluation wafer with a photosensitive film

5　coated on its surface on a wafer stage;

6　　　　illuminating, with a lighting optical system, said

7　evaluation mask that is provided with an evaluation pattern

8　having at least two line patterns, focusing an image of said

9　evaluation pattern on said evaluation mask onto the surface of

10　said evaluation wafer by means of a projection optical system

11　and exposing it to light;

12　　　　developing an exposed photosensitive film to form a

13　plurality of transferred patterns on said photosensitive film

14　each based on said evaluation patterns;

15　　　　distinguishing among said plurality of transferred

16　patterns, between ones having all said line patterns and ones

17　not having; and

18　　　　determining magnitude of coma aberration from the result

19　of such distinction.

1　15.　The coma aberration measuring method as claimed in Claim

2　14, wherein a plurality of said evaluation patterns are provided

3　on said evaluation mask and at least one of said line patterns

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4   is different from one another among said evaluation patterns.

1   16.   The coma aberration measuring method as claimed in Claim

2   15, wherein in each of said evaluation patterns, at least two

3   said line patterns are formed as a line portion between a pair

4   of reference lines; and

5   wherein in each of said transferred patterns, a relative

6   positional deviation in a direction of line alignment of a center

7   position of said line portion from a center position of said

8   reference line pair is measured and the magnitude of coma

9   aberration is determined based on said relative positional

10 deviation.

1   17.   The coma aberration measuring method as claimed in Claim

2   14, wherein a plurality of transferred patterns are formed by

3   executing said exposing a plurality of times with said evaluation

4   mask while varying exposure amount for each exposure.

1   18.   The coma aberration measuring method as claimed in Claim

2   17, wherein in said evaluation pattern, at least two said line

3   patterns are formed as a line portion between a pair of reference

4   lines;

5   wherein in each of said transferred patterns a relative

6   positional deviation in a direction of line alignment of a center

7   position of said line portion from a center position of said

8   reference line pair is observed; and

9   wherein the light exposure used for a transferred pattern

10 in which that relative positional deviation becomes substantial

11   is regarded as a critical exposure and the coma aberration which

12   corresponds to this critical exposure is defined as the coma

13   aberration for said optical system.